

GEOPHYSICAL VARIABLES AND BEHAVIOR: LV.
PREDICTING THE DETAILS OF VISITOR EXPERIENCES
AND THE PERSONALITY OF EXPERIENTS:
THE TEMPORAL LOBE FACTOR¹

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Summary.—The visitor experience, a more intense form of the normal sense of presence, emphasizes the deep belief of personal contact with an extraterrestrial (or religious) entity. Phenomenological details of visitor experiences are expected to reflect the functions of deep temporal lobe structures; common details involve cosmic meaningfulness, vestibular experiences, flickering, complex visual sensations and alimentary references. After intense experiences, interictal-like behaviors similar to religious conversions (widening affect, sense of personal, desire to spread the word, concern about Man's destiny) emerge. Normal people who are prone to these experiences show frequent temporal lobe signs and specific personality characteristics that include enhanced creativity, suggestibility, mild hypomania, anxiety, and emotional lability. Learning histories that encourage the use of right temporal lobe functions for the consolidation of memory, such as compartmentalization of beliefs or repression due to early sexual abuse, predispose to intense visitor experiences. The most frequent precipitants are psychological depression, personal (existential) stress and proximal exposure to the focal tectonic strain fields that accompany luminous phenomena. Possible neuropsychological mechanisms are discussed.

The visitor experience is a central theme in the protocols of normal people who report UFO phenomena (Evans, 1984). It is associated with the conviction that the experient has been exposed to a real, cognizant entity who originates from cosmic sources. Following the experience there are behavioral changes and alterations in the perception and interpretation of unusual events. This article presents evidence that these experiences are more intense variants of the normal "sense of presence." They are mediated by mesiobasal (amygdaloid-hippocampal) portions of the temporal lobes (Persinger, 1983b) and often evoke permanent, cognitive restructuring (similar to a religious conversion). If the neural substrate of the visitor experience is transient electrical lability within temporal lobe structures, then: (a) the phenomenological characteristics of these experiences should reflect temporal lobe function and (b) people with personality profiles that are strongly correlated with temporal lobe lability should be prone to these experiences.

That either endogenous or exogenous (surgical) stimulation of deep temporal lobe structures, such as the hippocampus and especially the amygdala, can evoke specific phenomenological patterns is well established (Gloor, 1972, 1986). The specific details are determined by the etiology (e.g., space occupying lesion, electrical focus, vasospasm), its location and the amount of

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cumulative brain damage (Weiser, 1983). Patients with partial complex or limbic (temporal lobe) epilepsy frequently report: the sense of a presence, depersonalization (feelings of unreality, out-of-body experiences), hearing-knowing from "internal" sources, vestibular sensations (most commonly internal vibrations, rising sensations in the thorax, floating or spinning), extreme anxiety or panic, forced thinking, odd smells (Ervin, 1975), sacral proprioception concerning the genitals and anal sphincter and (in females) erotic experiences. The latter has been suggested as evidence for the sexual dimorphism of limbic structures (Remillard, Andermann, Testa, Gloor, Aube, Martin, Feindel, Guberman, & Simpson, 1983). Visual phenomena vary from the experience of shadows, entities or colors in the peripheral field to complex animated sequences that are dominated by surrealistic or dream-like features. They contain substantial fantasies that are not always simple reiterations of personal experience (Horowitz & Adams, 1970).

The person who experiences (the experient) the phenomena is convinced that they are real; often the details are not clear but the person is convinced that something cosmic or profoundly significant has occurred. Typical interictal behaviors (Bear & Fedio, 1977; Geschwind, 1983) include widening of affect such that infrequent, odd events acquire special meaning, multiple references to psi phenomena, the conviction of special destiny (the person has been chosen by a special power), hypergraphia (the desire to record the significant experiences), an obsession with nascent themes (man's destiny, nature of the universe), communion with universal forces (Gods, entities, other dimensional creatures), and the conviction to proselytize or to spread the word (Dewhurst & Beard, 1970). Invariably there is amnesia and a history of time loss. Affective disorders and alterations in sexual behavior are common.

There is now evidence of a continuum of temporal lobe lability or sensitivity (Makarec & Persinger, in press; Persinger, 1983b, 1987b; Persinger & Makarec, 1987) within the normal population; people who display complex partial epilepsy (without convulsions) occupy the extreme portion of this continuum. The continuum is based upon the occurrence of microseizure-like activity that occurs routinely during normal dream (REM) sleep (Stevens, 1982) and the linear relationship between the numbers of mesiobasal temporal lobe neurons recruited during electrical transients and the intensity and display of epileptic experiences (Babb, Wilson, & Isokawa-Akesson, 1987). The concept is a logical development of Bear's (1979) sensory-limbic hyperconnectionism. Its validity within the normal population has been indicated by enhanced cross-modal matching in individuals who display enhanced temporal lobe signs (Sabourin & Persinger, 1987).

Several studies have shown that normal people who display *quantitatively* more temporal lobe (bipolar T3, T4) alpha activity (and hence greater

range in activity or lability) during test conditions also experience the phenomenological profile evoked by limbic seizures (Persinger, 1984a, 1984b; Persinger & Valliant, 1985). Although qualitatively similar to experiences associated with limbic seizures, the normal temporal lobe experiences are less intense and there is no classic electroencephalographic or clinical evidence of seizures. Special populations (poets, writers), who display an enhanced proclivity for limbic experiences, also display an increased incidence of small sharp spikes during resting (especially early nocturnal) EEG recordings (Makarec & Persinger, 1985, 1987). The spikes are similar to those reported in populations with familial associations of manic-depression (Small, Small, Milstein, & Moore, 1975) and the numbers of spikes are positively correlated with the numbers and frequency of benign limbic experiences.

These clinically normal (as defined by the Minnesota Multiphasic Personality Inventory) people more frequently report "feeling the presence of a Being or close contact with a universal consciousness during the early morning hours," lifting sensations or vibrations before falling asleep, "experiences of a smell from childhood just before falling down," depersonalization, and intense episodes of meaningfulness or cosmic insight between 0200 and 0400 hr. Normal individuals, without a clinical history of limbic seizures, also more frequently report widening of affect in conjunction with personal interpretations of mundane events, such as "when a tough personal decision has to be made a 'sign' will be given and I will know what to do." Strong positive correlations exist between temporal lobe signs and exotic beliefs (time-traveling) and psi experiences such as telepathy, clairvoyance, precognition (Persinger & Valliant, 1985). The latter are correlated with psi beliefs, a relationship that has been reported by others (Lester, Thinschmidt, & Trautman, 1987). People who report temporal lobe signs display a proclivity for reading or writing prose or poetry and are prone to generating and remembering vivid visual imagery, especially concerning childhood events. The latter capacity is correlated with specific EEG activity as well as temporal lobe signs (Makarec & Persinger, 1987).

Several personality inventories, the MMPI, California Personality Inventory (CPI), and Cattell's 16 PF have been remarkably consistent in the description of people who display frequent temporal lobe signs (Persinger, 1987a, 1988b; Persinger & Makarec, 1987). On the one hand, these people are more creative, versatile, intuitive, and interested in philosophical or aesthetic topics. However, scores on the temporal lobe scales are also positively correlated with anxiety (specifically forms that emerge as ego weakness and free-floating), emotional lability, tension, and excessive rumination (overthinking). When thought becomes inefficient, they are more prone to suspiciousness, delusions (sense of the personal), stereotyped (constricted)

thinking, panic (especially abstract death thoughts such as nuclear war), circumstantiality (or viscosity), and religiosity. The most single feature is occasional mild to moderate hypomania against a background of mild to moderate depression. Considering the persistent association between clinical mania and temporal lobe epilepsy and their shared treatment by some anti-convulsants such as carbamazepine or TEGRETOL (Post & Udhe, 1986), the occurrence of the hypomanic "spike" in normal people who report frequent complex partial epileptic signs is further support of the temporal lobe continuum.

People who display temporal lobe lability are also suggestible (Persinger & DeSano, 1986; Ross & Persinger, 1987). The more frequent the number of temporal lobe signs the more easily they dissociate, as defined by sensations of floating, spinning or visual imagery, during routine hypnotic procedures as well as the postepisodic partial amnesia. Measures of the amount of alpha activity over the temporal lobes specifically is correlated with experiences of odd smells while the numbers of temporal spikes are directly related to vivid imagery of early childhood, especially references to imaginary playmates.

Not surprisingly, temporal lobe signs and belief in psi are correlated with elevations on the Feeling scale of the Myers-Briggs Type Indicator (Huot & Persinger, submitted for publication), a relationship that has been noted by others (Lester, *et al.*, 1987). People with these profiles tend to become writers, actors, musicians, painters, poets, and abstract thinkers. Because people with these profiles are frequently found within specific vocations, such as the public media, the contribution of their beliefs to the assessment of visitor experiences must still be determined.

If temporal lobe processes are involved in the visitor experience, then the phenomenological patterns should be similar across experiences and effectively reflect the function of temporal lobe structures. The concept is well supported by modern neuroscience. Chugani and Phelps (1986) have demonstrated that the behavioral profile of a developing human is a function of that region of the brain displaying the greatest relative metabolic rate (the Kennedy principle). In a similar manner the phenomenological experience of a person will be dominated by that portion of the brain displaying the greatest electrical activity. The concept that fabric of emotional experience reflects the functions of the neuroanatomical substrate was developed by several authors, long before the advent of positron emission tomography.

Three prototypic biographies of visitor experiences: *Communion* (Strieber, 1987), a classic UFO abduction report, *Agartha* (Young, 1984), a description of a channeler concerning "other dimension" presence, and *Kundalini* (Krishna, 1985), a description of the emergence of mystical energy,

demonstrate ample support of the temporal lobe factor. In all of these accounts the experiences are associated with a predominant metaphor of sense of presence, swirling or vortical sensations, internal vibrations, floating sensations, alterations in perception (detection of auras and glows around the edges of objects), frank psi phenomena, and profound meaningfulness. Following the initial trigger experience and intermittent psychological depression (libido changes, sleep disturbances, withdrawal of affection), there was substantial cognitive restructuring such that life-long odd events became integrated and "meaningful," environmental events acquired a deep personal relevance, a conviction developed that they were chosen, and a desire to deliver the cosmic message to Mankind emerged. The reality of the experience was considered invariant.

Each account contained specific temporal lobe signs that should reflect the actual locus of the electrical lability within temporal lobe structures. For example, Whitley Strieber's (*Communion*) fundamentally aversive sensations associated with intense smells, hypervigilance, and anal sphincter images should reflect anomalous activity within the anterior parahippocampal gyrus with special involvement of the amygdaloid complex and adjacent uncus. Meredith Young's (*Agartha*) visual vibrations in the upper left visual field are almost pathognomic of electrical focus within Meyer's loop (Reitan & Wolfson, 1985) of the right temporal lobe and are common correlates in female patients with verified temporal lobe foci (Remillard, *et al.*, 1983). Gopi Krishna's (*Kundalini*) general profile was dominated by references to marked visual alterations and alimentary difficulties, which suggests involvement of the insula and adjacent claustrum.

Common images in the UFO abduction experience as well as the incubus nightmare involve odd humanoids. In light of the contribution of the mesiobasal structures to these aversive dreams and the reports of small humanoid forms with anomalous facial configurations by patients with active temporal lobe electrical foci (Crosby, Humphrey, & Lauer, 1962), the role of this structure in the production of this specific experiential phenomenon is suggested. There is also inferential evidence that these experiences are adult modifications of perinatal memories (Lawson, 1980, 1983). That the fetus has the cerebral capacity to detect and consolidate experience, including the representation (homunculus) of its own body, has been argued by Chamberlain (1987).

Although the neural mechanism by which these images might be accessed is not clear, one candidate involves the vestigial convolution of the hippocampal system, the indusium griseum (supracallosal gyrus). It regresses following birth (Carpenter & Sutin, 1983) but appears to maintain a state-dependent, functional capacity. This structure contains the longitudinal striae that extend the entire length of the corpus callosum and into the diag-

onal band of Broca that in turn interconnects with the amygdala and septum. During dream states, which are characterized by transient activation of hippocampal-amygdaloid pathways that are not stimulated during the normal waking (Brazier, 1972), these earlier experiences might be accessed but then modified by images from more recent memories during the process of translation to adult neocortical activity.

Both theoretical (Jaynes, 1976; LeMay, 1982) and clinical (Budzynski, 1986) evidence suggests that transient neuroelectrical discrepancy between the left and right temporal lobes is a precondition for the sense of presence. Because the right hemisphere displays a wide range of receptive capacity (even during borderline arousal levels) compared to the narrow band of arousal displayed by the left hemisphere, a substantial portion of the material that composed the visitor experience should be acquired by incidental learning during twilight states. The numbers of experiences could be accumulated over the experient's lifetime such that they begin to operate as functionally independent processes (Miller, 1986).

The major origin of a "functional commissurotomy" (Miller, 1986) between the left and right temporal lobes would be caused by a reinforcement history that emphasized compartmentalization (Persinger, 1987b). Some religious traditions, such as Catholicism, would facilitate this development. Severe trauma, such as early sexual abuse, would be equally effective given the consequent repression of unpleasant memories that would serve as source material for the experience. The importance of the temporal lobe factor in this process is strongly suggested by the moderate intercorrelations in patient populations between temporal lobe epilepsy, multiple personalities (Mesulam, 1981; Schenk & Bear, 1981), and early child abuse (Benson, Miller, & Signer, 1986).

Access to right hemispheric information would be facilitated during sleep (Broughton, 1986), especially if personal stress disrupts nocturnal periods, given both the bilateral coherence in amygdaloid-hippocampal activity and cortical arousal that constitutes dream sleep (Brazier, 1972). However, hypnosis would also facilitate access of this information (Gruenewald, 1984; McKeever, Larrabee, Sullivan, & Johnson, 1981). This tool would also contribute to the cognitive restructuring of personal information, a process that is useful in clinical settings. There is evidence that hypnosis may *generate* phenomena, especially the experience of time loss (von Kircheneim & Persinger, in press; Zimbardo, Marshall, White, & Maslach, 1973). If this procedure does create experiential changes, then the technique itself might contribute to the *production* of the UFO experience. Regression hypnosis would be a powerful process, facilitating a functional association between the person's life history of odd, infrequent and repressed experiences within a few brief clinical interviews (Kline, 1984).

Because the right hemisphere operates at the syntactic level of a five- to six-year-old and with the vocabulary of a young adolescent (Budzynski, 1986), articulation of experiences would be difficult initially. Experiences during the early stages of the visitor phenomena should be associated with alterations in right temporal lobe function; they include deficits in spatial orientation and spatial memory or mystical interest in geometric shapes (triangles, forms). Factors that facilitate a discrepancy between the left and right temporal lobes, such as left-hand preference (dominance) or the pursuit of a vocation that depends on right temporal lobe function (music, art, perception of subtle behavioral patterns) should be more evident in the over-all population of visitor experiencers.

The specific trigger for the visitor experience, particularly those associated with UFO phenomena, have been hypothesized to involve direct exposure to intense tectonic strain fields (Persinger, 1985). Although they are considered to be very focal and brief, people whose houses are built over susceptible areas (e.g., fault lines) may be exposed frequently (Persinger & Cameron, 1986). Because electrical lability of the temporal lobes is intense, their stimulation would generate the electrochemical changes that could promote the visitor experience. Short pulses of energetic stimuli would be optimal to facilitate the normal burst firing pattern of the human amygdala (Isokawa-Akesson, Wilson, & Babb, 1987).

In animal preparations, burst firing of hippocampal neurons for only a few seconds between 100 and 400 Hz is sufficient to promote long-term potentiation (Winson & Dahl, 1986). In fact, brief seizures can induce c-fos gene activity in the hippocampal formation with generalization to the neocortex (Morgan, Cohen, Hempstead, & Curran, 1987), an observation that supports the concept of memory modification (Persinger, 1987b) because this gene encodes a nuclear phosphoprotein that displays DNA binding. We have found that exposure to low-intensity, extremely low-frequency brain fields evokes partial amnesia (Michaud & Persinger, 1985; Persinger & Nolan, 1985), exacerbates vestibular images and alters suggestibility (DeSano & Persinger, 1987). Difficulty focusing applied magnetic fields to excite very small areas ($< 1 \text{ cm}^2$) of deep temporal lobe tissue is a primary technical problem.

However, the visitor experience could be evoked by other sources. Deep temporal lobe structures are very sensitive to ACTH (adrenocorticotrophic hormone) and glucocorticoids; consequently, psychological depression (especially in people whose creativity is coupled to temporal lobe transients), personal crises, grief, and other psychological trauma could generate the visitor experience. A more common but mundane form associated with grief is the bereavement (or *post mortem*) apparitional experience (Persinger, 1974) that appears to be promoted by sudden increases in geomagnetic activity

(Persinger, 1988a). In addition, the mantra repetitions of meditation (or more traditionally prayer), perhaps the strongest verbal analogues of kindling (Persinger, 1984c), can generate specific temporal lobe lability (Persinger, 1987b). If ACTH fragments are essential for normal amygdaloid kindling (Rogers & Jackson, 1987), then psychological stress may be a *prerequisite* for the maintenance of the amygdaloid activity that mediates and promotes the perception of the visitor experience.

To date there have been few controlled studies to determine the neuropsychological mechanisms of visitor experiences. They are reported by clinically normal people who display many of the personality and phenomenological characteristics described earlier. For example, in one case investigated by this researcher, a 35-yr-old woman reported that she was visited by creatures who surrounded her bed during the night and intermittently carried her away. She could only sense their presence because they vibrated so quickly and reflected light strangely. They were "felt" to be small creatures with large heads and infant-like eyes.

The creatures seemed obsessed with her sexual organs and tried to operate upon her. Wheals and later warts were reported around the pubic area and on the left hand. Except for a mild elevation on the hypomania and *F* (validity) scales of the MMPI, she responded as a normal, middle-aged female. The only remarkable feature was her enhanced suggestibility, an early history of sexual abuse, and a recent episode with cocaine about 6 mo. before the incident. The visitors disappeared with carbamazepine, a drug that is specific to complex partial epilepsy and hypomania. Although this treatment may not be beneficial for all such cases, it emphasizes the importance of understanding the neuropsychological mechanisms.

Visitor experiences have been persistent phenomena throughout the phenomenological history of man, especially during periods of crisis (Suedfeld & Mocellin, 1987). Often they have been associated with extraordinary creativity (Bauer, 1970) and intuitive insight concerning human behavior. Semantic sequences evoked during a few, protracted visitor experiences, such as those of Joseph Smith ("Mormons"), Mohammed (Islam), and Christ (Christianity), have had significant historical influence. The prediction of the thematic patterns of visitor experiences and the personalities of the experiencers should allow the generation of testable hypotheses within experimental and clinical settings.

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